

REMARKS

Applicants gratefully acknowledge that the Examiner has found patentable subject matter in claims 25-26 and 32-34, and approved the drawings and claims of priority.

The foregoing amendment in the title provides one more descriptive of the invention, as requested in paragraph 5 of the pending Office Action.

Applicants also note the request in paragraph 4 to check the specification for possible minor errors. A computer spell and grammar check of the specification revealed no such errors requiring correction.

Pursuant to the election of species made by Applicants -- to prosecute Species III, directed to an embodiment where the first wavelength is parallel and 2nd order, and the second and third wavelengths are diverging and 1st order -- and in view of the Examiner's determinations as to the claims in prosecution, Applicants have noted as withdrawn claims 1-13, 16-20, 29-31, and 35-51. Claim 21 was examined, and is pending. In the Office Action mailed on April 13, 2006, page 3, line 2, the Examiner listed claim 21 as generic. Applicants presume that this description was reconsidered, and claim 21 is now determined by the Examiner as directed to elected Species III.

The foregoing amendments in claim 27 and 28 add definitions of Φ_{inb} and Φ , respectively to overcome rejection under 35 USC 112, second paragraph, as discussed in paragraph 6, page 3 of the Office Action. This definition of Φ_{inb} appears in the specification at page 103, after Equation 15. The definition of Φ in claim 28 appears in the specification at page 105, lines 8-9. There are no art rejections against claims 27 and 28; they are now believed to be in condition for allowance.

The amendments in claim 21 add the limitation "the third light beam is incident on the diffraction optical element as a diverging ray," which is the same limitation as appears in allowable claim 25. Support for this amendment also appears on page 94 (Third embodiment) of

the specification and in Fig. 12. Claim 21 is therefore believed to patentably distinguish over the art of record, and to be otherwise allowable.

In addition, in line 15 of claim 21, “focusing” is changed to “tracking.” This corrects an inadvertent error. A movement of the objective lens in a “substantially orthogonal direction with respect to respective optical axes ...” is clearly a sideways translation of the lens with respect to the recording medium. A movement of the objective lens along the optical axes would affect the focus.

Applicants respectfully traverse the rejection of claims 14-15 under 35 USC 102(e) as anticipated by Ohtaki et al. (U.S. Patent No. 6,449, 095).

Independent claim 14 covers the optical pickup shown in Fig. 10. For $\lambda 1$, Fig. 10(a) shows the incident light as parallel (as claimed).

The diffraction optical element as claimed, in addition to diffracting light, converges an incident light beam toward an optical axis. In other words, the diffraction optical element defined in claim 14 includes both a concave face and a separate diffraction face to produce these functions.

In contrast, the diffraction optical element shown in Figures 5A and 5B of Ohtaki et al. only has the diffracting function. While the Examiner points to a discussion of different Figures in Ohtaki that refer to a concave surface, this surface is actually that of the diffracting face. Moreover, even if it were a refracting face, light incident on a concave face of an optical element having a planar exit face, as shown and described in Ohtaki, would diverge from the optical axis, not converge.

The diffraction optical element as claimed in claim 14 of the present invention is structurally different from the diffraction optical element shown in Figures 5A and 5B of Ohtaki et al.

Claim 15, dependent from claims 14, includes these structural differences over the Ohtaki reference. Claims 14 and 15 are therefore clearly not anticipated by Ohtaki et al., and believed to be in condition for allowance.

Applicants also respectfully traverse the rejection of claims 21 and 22 under 35 USC 103(a) as obvious over Shiono et al. (U.S. Patent No. 6,987,615) in view of Katayama et al. (U.S. Patent No. 5,696,750)

Claim 21 recites using three light beams (first, second and third light beams) of different wavelengths to respectively converge these light beams, using a single objective lens, on the recording faces of the first, second, and third recording media having transparent layers of different thicknesses. To this end, claim 21 defines a structure in which the third light beam (corresponding to infrared light used for CDs) is incident on the diffraction optical element as a diverging ray.

With such a diverging third light beam incident on the diffraction optical element, the absolute values for the degrees of convergence and/or divergence of incident light on the diffraction optical element can be made relatively small for the first and second light beams.


As taught in Shiono et al., two light beams of the first and second wavelengths are incident on the diffraction optical element as parallel rays (col. 11, lines 52-60, Fig. 8). However, Shiono et al. does not describe anything about light of a third wavelength, let alone a disclosure of a third beam. IR light for CDs, the third light beam, is described with respect to the present invention.

In Katayama, the IR light for CDs is described, but 1) as part of a two-beam system and 2) as being incident on the diffraction optical element as a parallel ray (col. 6, lines 1-4, Fig. 5).

In sum, Shiono et al. does not teach or suggest a third light beam, and Katayama merely describes two beams, with one being a beam at a wavelength that Applicants describe for use as their “third” light beam being incident on the diffraction optical element as a parallel ray. Neither reference teaches the invention as claimed. Nor is there any teaching, motivation, or suggestion that one can or should, somehow, combine these references to produce the invention defined in claim 21 (three kinds of light beams (first, second, and third light beams) of different wavelengths to respectively converge these light beams on the recording faces of the first, second, and third recording media having transparent layers of different thicknesses, using a single objective lens).

In view of the above amendments, Applicants urge that the pending claims all patentably distinguish over the art of record, and that this application is otherwise in condition for allowance.

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